

# Current Projects - Lakes, Ponds and Reservoirs

For more information on this project, please contact:

Jonathan Meerbeek  
Spirit Lake Hatchery, 122 252<sup>nd</sup> Avenue  
Spirit Lake, IA 51360  
(712) 336-1840  
[Jonathan.Meerbeek@dnr.iowa.gov](mailto:Jonathan.Meerbeek@dnr.iowa.gov)



## Shallow Lake Renovation Based on Alternative Stable Trophic States

Shallow natural lakes in Iowa are notorious for poor water quality. Shallow lakes are known as “tweeners” since they are too shallow to be consistently good lakes, and too deep to be consistently good marshes. Alternative stable trophic states means that shallow lakes in Iowa can exist in one of two conditions: the turbid water state or the clear water state. When these lakes are in the turbid water state they are characterized by very turbid water, little to no aquatic vegetation, limited emergent vegetation, a sparse fishery dominated by carp and bullheads, and limited waterfowl production. However, many of these same lakes can also be in a clear water state which is typified by clear water, abundant aquatic vegetation, shallow bays covered with emergent vegetation, a desirable fishery dominated by sport fish species, and enhanced waterfowl production. The goal of this project is to develop tools that managers can use to shift and maintain shallow lakes in a clear water state.

Diamond Lake in Dickinson County is one of these “tweener” lakes and was a good candidate for restoration. Some of the recent improvements include: lake drawdown, removal of rough fish species through winter kill and rotenone application, installation of a fish barrier at outlet, and improved water level control structure. We documented a substantial response in emergent and submergent vegetation following the renovation. Thirty-five unique species of aquatic plants have been identified between 2009-2012 (only 4 species present pre-project). Water clarity/quality has improved substantially since the drawdown. In 2012, dense stands of aquatic vegetation persisted from early summer to late fall as a result of good water clarity and low water levels. Diamond Lake was stocked with yellow perch in 2009 and 2010 and northern pike in 2010. Growth rates of yellow perch and northern pike were exceptional since renovation and currently, both species are naturally reproducing.

Lost Island Lake is a 1,180 acre shallow (< 18 ft) lake located in Northwest Iowa that has an additional 1,000 acres of connected wetland habitat that have all suffered from poor water quality. Our management strategy for this complex system involved incentive-based commercial removal of common carp, installing fish barriers to prevent carp from reaching spawning areas, enhanced predator stocking, and targeted watershed improvements. Since 2008, mark-recapture techniques were used to estimate common carp abundance and biomass. From 2008-2012, about 738,000 lbs of carp were removed from the lake by commercial fisherman. Population estimates of common carp dropped from 136,718 fish in 2008 to 10,651 fish in 2012. However, successful common carp reproduction was documented in 2012, thus suggesting that enhanced predator stockings and fish barriers have not been 100% effective in controlling reproduction. Water quality has improved substantially and in 2012, submersed aquatic vegetation documented in 28 of 30 vegetation transects. Continued monitoring of the common carp population and incentive-based commercial carp harvest will be important tools to guide future management and research in Lost Island Lake.